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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/774,549

02/09/2004

Ken Furukuwa

81716.0119

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7590

10/11/2005

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EXAMINER

BEVERIDGE, RACHEL E

ART UNIT

PAPER NUMBER

1725

DATE MAILED: 10/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/774,549

Applicant(s)

FURUKUWA, KEN

Examiner

Rachel E. Beveridge

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2, 5, 6 and 8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2, 5, 6, and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 10/223973.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/10/2005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2,5,6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makoto et al. (JP406120634A).

With respect to claim 2, Makoto discloses a method for making a ceramic board by preparing a ceramic substrate (figures 1-3[11]) with a through hole (figures 1-3[12]). Makoto also discloses a metal column (figure 1[13]) with a brazing material (figure 1[14A, 14B]) and metal circuit plates (figure 1[15A,15B]). Furthermore, Makoto discloses the metal column with brazing material within the through hole of the ceramic substrate and the metal plates on both sides of the substrate in order to fill the through hole (abstract). Makoto also discloses heating the brazing material and joining the metal column and the metal circuit plates together (abstract). Makoto discloses the metal column and brazing materials to be the "pin" (figure 1[13]) with a length slightly smaller than the length of the through hole (figure 1[12]), around 0.3mm to 0.4mm; thus, fitting within applicants said 40 to 140 μ m longer relative to the thickness of the ceramic substrate. Also, Makoto lists approximate values for the length of the brazing materials on each side of the metal column. Makoto does not specifically disclose the metal column alone to be 0 to 150 μ m shorter than the length of the through hole. However, it

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would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Makoto by limiting the height of the metal column to 0 to 150 μm relative to the thickness of the substrate in order to create a circuit board for large power to offer and combine the through hole structure where resistance is low with the simple flow approach of the diameter of the through hole (paragraph 6).

Regarding claims 5 and 6, Makoto discloses metal circuit plates (figure 1[15A, 15B]) made of aluminum and a metal column (figure 1[13]) made of aluminum alloy (abstract). With regard to claim 8, Makoto clearly shows a space between the inner wall of the through hole and the outer wall of the metal column in figure 1[12]. Makoto also discloses a through hole with diameter of 1.0mm (paragraph 18) and a metal cylinder with diameter of 0.8mm (paragraph 20). Thus, the space between each wall of the column and substrate is respectively 0 to 0.1mm (100 μm) and fits within the applicants said range of 30 to 200 μm in length.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: JP02001068808A.

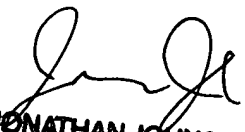
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rachel E. Beveridge whose telephone number is (571) 272-5169. The examiner can normally be reached on Monday through Friday, 8:30 am to 5 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Dunn can be reached on (571) 571-1171. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

REB


JONATHAN JOHNSON
PRIMARY EXAMINER